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AI-Driven Transformation in Higher Education: Occupational Stress, Job Insecurity, and Performance Outcomes Among University Faculty

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Abstract

The proposed research discussed the effect of the deployment of Artificial Intelligence in higher education on occupational stress among faculty members in both deemed and private universities. The faculty members underwent a dramatic shift in job roles and expectations to perform as more aspects of teaching, evaluation, research analytics, and administration were integrated with AI-driven tools. The study theorized the adoption of AI as a factor of technological transformation that induced job insecurity, faculty stress, and job performance. It was a quantitative cross-sectional study, and the data were collected through a structured questionnaire based on a 5-point Likert scale administered to faculty members in deemed and private universities. Partial Least Squares Structural Equation Modelling (PLS-SEM) was used to analyse the measurement and structural models. The results suggested that the adoption of AI had a large impact on job insecurity and faculty stress, and it also affected job performance outcomes. The connection between the adoption of AI and stress and performance among faculty members was partially mediated by job insecurity. The study identified the psychological and performance impacts of AI-based change in higher education institutions and provided insights for policymakers and university administrators to develop supportive transition measures.

Keywords: Artificial Intelligence Adoption; Occupational Stress; Faculty Stress; Job Insecurity; Job Performance; Higher Education Institutions.

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1. Introduction

The quick adoption of Artificial Intelligence (AI) technologies into the higher education system has completely changed the academic workplace environment across the globe. Universities are embracing AI-based teaching support systems, automated evaluation, research analytics, administrative decision-making, and learners' engagement. However, as much as these innovations are expected to lead to increased efficiency, data-driven insights, and increased competitiveness in the institution, they also reinvent faculty roles and expectations. In deemed and private universities, where performance indicators, research productivity, and technological competitiveness are about to enter the limelight, the adoption of AI can be seen as not only a technological change but also a structural change in the field of academic output. Therefore, the problem of determining the effects of the AI-driven change on the psychological and professional experiences of faculty members has become a pressing research issue.

The introduction of AI introduces a new paradigm in academia, where the digital environment creates new challenges in both workload and career monitoring, and demands constant technological adaptability. Teachers need to learn new skills related to digital competencies, to adapt their pedagogical methods, and to adjust to new expectations imposed by the institution. These changes can cause occupational stress when the technological demands go beyond institutional support (or coping resources) of the individual. Also, as teaching, assessment and administrative tasks are becoming more automated, teachers can feel that they are being potentially displaced, have less autonomy in their work or that their knowledge is no longer relevant or useful. The sense of threat from technological replacement can exacerbate psychological tension and uncertainty, particularly in professions where one's identity and intellectual ability are core components, like academia.

While the use of Artificial Intelligence in higher education is gaining traction, the literature so far has concentrated on the positive aspects of this application from the standpoint of efficiency, innovation, personalization of learning and institutional effectiveness. The use of AI and its applications in education, as such, are thus well documented in the literature. But the psychological impact of AI on teachers, especially in the Indian higher education landscape is largely under-studied. There is very little empirical evidence on the impact of AI-induced transformation on occupational stress, job insecurity and job performance of faculty members in Indian Universities.

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Furthermore, few studies have investigated the mediation of job insecurity in understanding how job insecurity relates to faculty outcomes when it comes to AI adoption. It is a crucial research gap given the growing adoption of AI technologies in higher education settings in India, both academically and administratively. In this regard, the study aimed to investigate the potential mediation role of job insecurity on the relationship between the use of AI in the deemed and private universities and occupational stress and job performance. The study was statistically robust, using a quantitative method and the Partial Least Squares Structural Equation Modelling (PLS-SEM) approach to enable a deeper understanding of the impacts of AI-mediated transformation in higher education on both the human and the organizational level, as well as to provide practical implications for university administrators and policymakers faced with the task of implementing transition strategies that seek to support that transformation.

2. Literature Review

Judge et al. (2001) investigated the interaction between job stress and job performance and discovered that, sustained psychological pressure decreases engagement, creativity and productivity. The study was able to determine through quantitative meta-analytic methods that negative emotional states undermine the effectiveness of work in the long run. Even though technology has the potential to increase efficiency, it makes little sense when stress and insecurity are experienced by the employees. These results offer empirical evidence to the path in the model in which faculty stress is associated with job performance outcomes in academic institutions enabled by AI.

Sverke et al. (2002) in his work on meta-analysis shows that, perceived employment instability is a significant predictor of anxiety, diminished organisational commitment, and low job satisfaction. The paper has pointed out that technological change has a tendency to exacerbate insecurity where employees have the fear of being sidelined or becoming irrelevant professionally. Notably, the job insecurity was also mediated to be between organizational change and psychological strain. This is the direct support of the addition of Job Insecurity to the list of mediating constructs between AI adoption and faculty stress and performance outcomes.

De Witte (2005) examined the psychological processes of job insecurity and came to the conclusion that perceived threats of job insecurity are long-term stressors that negatively affect well-being and performance. Through the empirical research conducted by surveys, the study

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proved that insecurity has a negative effect on motivation, engagement, and emotional stability. Technological disruption can increase insecurity perceptions in knowledge-based careers like in academia where professional identity is paramount. In this way, this literature will offer theoretical support to the importance of positioning job insecurity as an important explanatory factor in AI-centered change situations.

Bakker and Demerouti (2007) model of Job Demands and Resources (JD-R) was used to argue that the higher the job demands were, the less was the resources and the performance would be low and burnout would occur. Their empirical results show that technological changes could act as some extra job demands especially when the skills requirements are growing at a high rate. The expectations set by AI in the higher education sector can increase demands, but the institution support systems are falling behind. This theoretical viewpoint supports the investigation of the role of AI adoption in the indirect influence of job performance via stress-related mechanisms.

Kinman (2014) explored the topic of occupational stress in university employees and found the additional workload, performance accountability, and managerial monitoring to be significant predictors of stress. The research employed the cross-sectional survey design and concluded that the institutional pressures greatly impact the psychological health and job performance. As AI penetrates more and more in the context of performance surveillance and data-driven assessment systems, these results imply that digital transformation can contribute to the aggravation of current stressors in advice settings. Thus, faculty stress becomes a key result variable when it comes to AI adoption.

Tarafdar et al. (2015) analyzed the phenomenon of technostress in organizations and discovered that digital transformation can be positively related to cognitive overload, role ambiguity, and emotional exhaustion in employees, which are much higher when the transformation is rapid. The paper has highlighted that stress due to the use of technology occurs when people view digital systems as pressuring them instead of empowering them. Through quantitative survey techniques and structural modeling, the researchers have shown that overly high technological requirements have bad implications on job satisfaction and well-being. These results support the fact that Faculty Stress should be included in the model, which implies that AI-based systems in higher education institutions can increase psychological stress under the condition of insufficient training and institutional backup.

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Zawacki-Richter et al. (2019) have presented a systematic review of the usage of AI in the field of higher education and highlighted that AI technologies have been applied to improve adaptive learning, automated grading, predictive analytics, and institutional decision-making. The research has noted the enhancement of efficiency, personalization, and monitoring of academic performance. Nevertheless, even with these benefits, the authors presented obstacles that include lack of digital capabilities in faculty, privacy of data, high cost of implementation, and organizational change resistance. Notably, the study reported, most adoption problems are based on uncertainty and institutional disjointure on the part of the faculties and not technical constraints. This observation underpins the fact that adoption of AI should be included as a revolution, yet also disruptive element that could shape faculty attitude and work experiences in higher education.

3. Objective of the Study

1. To examine the impact of Adoption of Artificial Intelligence in Higher Education on Job Insecurity among faculty members in deemed and private universities.
2. To analyze the effects of Job Insecurity on Faculty Stress and Job Performance outcomes in higher education institutions.
3. To investigate the direct and indirect (mediated) relationships among AI Adoption, Job Insecurity, Faculty Stress, and Job Performance.
4. To develop and validate a structural model explaining the psychological and performance implications of AI-driven transformation in higher education.

4. Hypotheses of the Study

Direct Effect Hypotheses

H1: Adoption of AI in Higher Education has a significant positive effect on Job Insecurity among faculty members.

H2: Job Insecurity has a significant positive effect on Faculty Stress.

H3: Job Insecurity has a significant negative effect on Job Performance.

H4: Faculty Stress has a significant negative effect on Job Performance.

Mediation Hypotheses

H5: Job Insecurity mediates the relationship between Adoption of AI and Faculty Stress.

H6: Job Insecurity mediates the relationship between Adoption of AI and Job Performance.

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5. Research Methodology

The research adopted a quantitative research design to examine the effects of Artificial Intelligence on the occupational stress of faculty members in deemed and private universities, and to determine the effects of AI on the occupational stress of faculty members in deemed and private universities. Bangalore was selected as the study area due to its status as India's technology hub and its high concentration of AI-integrated private and deemed universities. The city provides an appropriate setting for examining the influence of artificial intelligence on academic work environments, as higher education institutions in Bangalore have increasingly adopted AI-based tools for teaching, assessment, research, and administrative functions. Primary data were gathered through a structured self-administered questionnaire using a five-point Likert scale to assess the constructs of AI adoption, job insecurity, faculty stress, and job performance. To support the contextual analysis, secondary data were obtained from UGC reports, AISHE publications, Ministry of Education documents, peer-reviewed journals, and institutional reports. A sample size of 120 was considered for the study. The target population consisted of professors, associate professors, assistant professors, and lecturers working in deemed and private universities in Bangalore who had been exposed to AI-based academic tools. A purposive sampling method was used to select respondents from the target population. Structural modeling techniques were employed to analyze the data and investigate the direct and mediating relationships among the constructs.

6. Data Analysis and Interpretation

6.1 Measurement Model

The measurement model is strongly reliable and convergent. The alpha values (0.884-0.896) and composite reliability (0.885-0.901) are higher than the recommended alpha of 0.70 which proves internal consistency. The values of the AVE (0.684-0.707) exceed 0.50, which means that every construct is capable of explaining over 50 per cent of the variance in indicators. Such results affirm that the constructs are reliable, as well as valid, in order to undertake an additional structural analysis.

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Table 1

Reliability and Convergent Validity

	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
AI Adoption	0.885	0.894	0.684
Faculty Stress	0.896	0.901	0.707
Job Insecurity	0.884	0.885	0.684
Job Performance	0.894	0.897	0.702

Discriminant Validity (HTMT): The HTMT ratios are not greater than the recommended level of 0.85 and the highest is 0.817 between Job Insecurity and Faculty Stress. This gives a sign of sufficiency in discriminant validity, which proves that the constructs are empirically differentiated despite their conceptual association in the model.

Table 2

Discriminant Validity Using HTMT Ratio

	AI Adoption	Faculty Stress	Job Insecurity	Job Performance
AI Adoption	—			
Faculty Stress	0.567	—		
Job Insecurity	0.680	0.817	—	
Job Performance	0.470	0.729	0.728	—

Coefficient of Determination (R^2): The values of R^2 reveal that the model is moderately explaining. 37.4% of the difference in Job Insecurity can be explained by AI Adoption. Faculty Stress can be explained by Job Insecurity at 53.2%, and Job Insecurity and Faculty Stress together can be used to explain Job Performance at 42.3%. The values indicate that the model is not a bad predictor.

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Table 3

Coefficient of Determination

	R-square	R-square adjusted
Faculty Stress	0.532	0.528
Job Insecurity	0.374	0.369
Job Performance	0.423	0.418

Model Fit: The overall fit of the model is acceptable. The values of SRMR (0.062 and 0.078) are less than 0.08, which means good fit. The values of NFI (0.859 and 0.851) are near to the acceptable value of 0.90, and other fit indices (d_ULS, d_G, Chi-square) are within acceptable limits. In general, the structural model has sufficient abilities to depict the facts.

Table 4: Model Fit

	Saturated model	Estimated model
SRMR	0.062	0.078
d_ULS	0.813	1.265
d_G	0.349	0.381
Chi-square	234.802	248.152
NFI	0.859	0.851

6.2 Structural Model

Figure 1: Structural Model

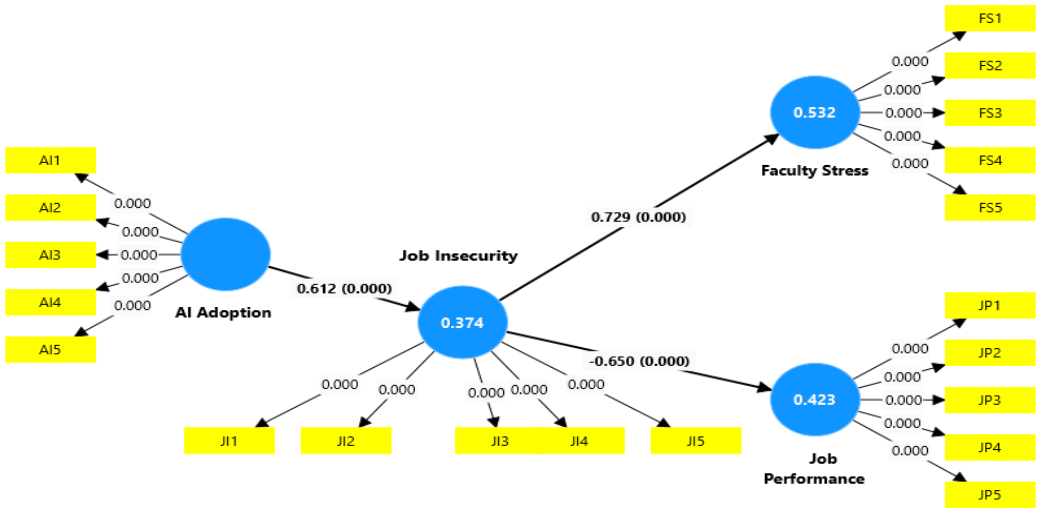

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Table 5: Structural Estimate

Direct Effect	Beta	SD (STDEV)	T statistics	P values
AI Adoption → Job Insecurity	0.612	0.055	11.157	0.000
Job Insecurity → Faculty Stress	0.729	0.041	17.743	0.000
Job Insecurity → Job Performance	-0.650	0.053	12.244	0.000
Indirect Effect	Beta	SD (STDEV)	T statistics	P values
AI Adoption → Job Insecurity → Job Performance	-0.398	0.053	7.489	0.000
AI Adoption → Job Insecurity → Faculty Stress	0.446	0.054	8.245	0.000

Direct Effects: The structural findings indicate that the adoption of AI substantially raises Job Insecurity ($\beta = 0.612$, $p < 0.001$). Faculty Stress and Job Performance are significantly positively and negatively related to Job Insecurity ($\beta = 0.729$, $p < 0.001$) and ($\beta = -0.650$, $p < 0.001$) respectively. There is statistical significance of all the direct relationships, which supports the hypotheses proposed and means that AI-driven transformation increases the levels of insecurity and stress and affects performance in an adverse way.

Indirect (Mediation) Effects: The mediation analysis proves that Job Insecurity is a significant mediator in the relationships between AI Adoption and Faculty Stress ($\beta = 0.446$, $p < 0.001$) and Job Performance ($\beta = -0.398$, $p < 0.001$). This represents that the adoption of AI has an indirect impact on stress and performance in the form of enhanced perceptions of job insecurity, which confirms the mediating hypotheses.

7. Conclusion

The current research investigated psychological and performance ramifications of the adoption of Artificial Intelligence (AI) in higher education with the mediating effect of job instability among

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faculty in both the deemed and the private universities. The results affirm that the use of AI has significant effects in enhancing perceptions of job insecurity which in itself lead to an increase in faculty stress and a negative job performance. Measurement model was found highly reliable, convergent valid as well as discriminant valid and structural model exhibited moderate explanatory power and model fit. These findings support the presented conceptual framework and prove that the transformation of higher education under the influence of AI has significant psychological and behavioral implications.

The structural relationships indicate that the issue of job insecurity is central to the explanation of the impact of the adoption of AI on the outcomes of the faculty. Job insecurity is strongly predictable by the use of AI, which in turn leads to stress among jobs and low job performance. The mediation analysis continues to show that the effect of AI on stress and performance is indirectly through insecurity perceptions. This puts emphasis on the fact that technological change in higher education is not just a technical and functional transformation, but a socio-psychological process that can impact on the well-being and productivity of the faculty.

All in all, the research highlights the significance of the human aspects of AI adoption in the institutions of higher learning. Although AI provides efficiency, innovativeness and data-driven advantages, its effective implementation is determined by institutional support systems, open communication, digital skills acquisition, and change management policies. Universities can reduce stress and maintain performance outcomes even in cases of technological change by responding to faculty concerns about job stability and professional identity. The results offer useful information to policymakers and administrators who may want to integrate AI in an academic institution in a responsible and sustainable manner.

8. Scope for Further Research

The current research is based on faculty members of deemed and private Universities within Bangalore that introduces the restriction of the results to other geographical areas and institutional settings. Further studies can consider expanding the study to higher education institutions (e.g., universities) and independent colleges and institutions in various states or countries to determine how AI-induced stress affects various educational systems. Cross-cultural comparative research can give more in-depth information on how institutional policy and technological preparedness affects the faculty attitude towards AI adoption.

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The longitudinal research design can be implemented in future studies to investigate the changes in AI-induced stress and job insecurity with time as faculty members increasingly adjust to technological changes. Moreover, moderating factors like digital literacy, organizational support, leadership style, resilience, and coping strategies may be examined in future studies in order to have a clearer perspective on the buffering processes. The theoretical framework might also be enriched with the psychological constructs, i.e., burnout, work engagement, and professional identity.

Lastly, the qualitative research methods like in-depth interviews, case studies, and focus group discussions might be utilized to elaborate on the faculty experience of AI transformation. The effectiveness of institutional training programs and stress management initiatives could be studied through experimental or intervention based studies. Incorporating student outcomes or institutional performance indicators into the model could also create a better image of the long-term outcomes of AI in higher education.

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